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SUPERSEDING
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MILITARY SPECIFICATION

CONNECTORS; MINIATURE AUDIO, FIVE-PIN AND SIX-PIN GENERAL SPECIFICATION FOR

This specification is approved for use within the Communications-Electronics Command, Department of the Army, and is available for use by all Departments and Agencies of the Department of Defense.

1. SCOPE

1.1 Scope. This specification covers waterproof, polarized, five and six contact, electrical connectors (plugs and receptacles) for use in audio frequency circuits at 60 volts maximum potential and 0.5 amperes maximum current.

1.2 Designated Types. The following connectors are covered by this specification:

Plug Connectors. (Connector Plugs U-228( )/U and U-229( )/U are field serviceable and replace the unserviceable molded boot type Connector Plugs U-181( )/U and U-182( )/U.)

U-182( )/U (Rigid contacts mates with U-228, U-183)
U-228( )/U (Non-rigid contacts mates with U-229( )/U, U-182( )/U)
U-229( )/U (Rigid contacts mates with U-228( )/U and U-183( )/U)

Receptacle Connectors.

U-183( )/U (Non-rigid contacts mates with U-229( )/U).

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to Commander, AMSEL-ED-TO, Fort Monmouth, New Jersey 07703-5000 by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

AMSC N/A FSC 5935

DISTRIBUTION STATEMENT A. APPROVED for public release; distribution is unlimited.

1.2.1 Cable size Accommodation. The cable size accommodation is identified by a DASH number in accordance with Table I. This number indicates the outside diameter of the cable that the connector will accommodate.

TABLE I

DASH NO.	CABLE DIA.
-0	N/A
-1	.165 ± .010
-2	.228 ± .010
-3	.250 ± .010
-4	.290 ± .010
-5	.320 ± .010

1.2.2 Connector Part Numbers. Connector part numbers will be designated in the following manner:

M55116/XX-X

Designation of specification SHEET number, use latest revision.

Cable size designator (0 thru 5) in accordance with Table I.

2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 Specifications and standards. The following specifications and standards form a part of this specification to the extent specified herein. Unless otherwise specified, the issues of these documents shall be those listed in the Department of Defense Index of Specifications and Standards (DODISS) and supplement thereto, cited in the solicitation.

SPECIFICATIONS

FEDERAL

FED-STD-H28	Screw-Thread, Standard for Federal services.
QQ-P-35	Passivation treatments for corrosion resisting steel.
QQ-N-290	Nickel plating.
L-P-410	Plastic, Nylon, Rigid .
QQ-C-530	Copper-Beryllium alloy bar, rod, and wire.
PPP-B-566	Boxes, Folding, Paperboard.
PPP-B-601	Box, Wood, Cleated-Plywood.
PPP-B-621	Box, Wood, Nailed and Lock Corner.
QQ-B-626	Brass, Leaded and Non Leaded.
PPP-B-636	Box, Fiberboard.
PPP-B-640	Box, Fiberboard, corrugated, Triple-Wall
PPP-B-676	Box, Set-up.

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MIL-M-14	Molding Plastics and Molded Plastic Parts, Thermosetting.
MIL-P-116	Preservation, Method of.
MIL-R-3065	Rubber, Fabricated Products.
MIL-B-3959	Barrier Material for Moderately Waterproof Interior Packaging.
MIL-T-28800	Test Equipment for use with Electrical and Electronic Equipment, General spec.
MIL-M-13231	Marking of Electronic Items.
MIL-C-13924	Coating, Oxide, Black, for Ferrous Metals.
MIL-F-14072	Finishes for Ground Signal Equipment.
MIL-G-45204	Gold Plating, Electrodeposited.
MIL-C-55330	Connectors, Electrical, Packaging of.

STANDARDS

MILITARY

MIL-STD-105	Sampling Procedures and Tables for Inspection by Attributes.
MIL-STD-129	Marking for Shipment and Storage.
MIL-STD-810	Environmental Test Methods and Engineering Guidelines
MIL-STD-202	Test Methods for Electronic and Electrical Component Parts.
MIL-STD-252	Wired Equipment, Classification of Visual and Mechanical Defects.
MIL-STD-889	Dissimilar Metals.
MIL-STD-1344	Test Methods for Electrical Connectors.
MIL-STD-45662	Calibration Systems Requirements.

(Copies of specifications standards, handbooks, drawings, publications, and other Government documents required by contractors in connection with specific acquisition functions should be obtained from the contracting activity or as directed by the contracting activity).

2.2 Other publications. The following documents form a part of this specification to the extent specified herein. Unless otherwise specified, the issues of the documents which are DOD adopted shall be those listed in the issue of the DODISS specified in the solicitation. Unless otherwise specified, the issues of documents not listed in the DODISS shall be the issue of the nongovernment documents which is current on the date of the solicitation.

AMERICAN SOCIETY FOR TESTING and MATERIALS (ASTM)

ASTM A313	Chromium-Nickel Stainless and Heat-Resisting Steel Wire.
ASTM A582	Free Machining Stainless and Heat-Resisting Steel Wire
ASTM D4066	Nylon Injecting and Extrusion Materials

(Application for copies should be adressed to the American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103)

(Nongovernment standards and other publications are normally available from the organizations which prepare or distribute the documents. These documents may also be available in or through libraries or other informational services)

2.3 Order of precedence. In the event of a conflict between the text of this specification and the references cited herein (except for associated detail specification, specification sheets or MS standards), the text of this specification shall take precedence. Nothing in this specification, however, shall supersede applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1 Specification Sheets. The individual part requirements shall be as specified herein and in accordance with the applicable specification sheets. In the event of any conflict between the requirements of this specification and the specification sheets, the following shall be the order of precedence.

a. Specification sheets.
b. Specification.

3.2 Qualification. The connectors furnished under this specification shall be products which are qualified for listing on the applicable qualified products list at the time set for opening of bids (See 4.5 and 6.5)

3.3 Materials. The material for each part shall be as specified herein. However, when a definite material is not specified, a material shall be used which will enable the connector to meet the performance requirements of this specification.

3.3.1 Plastics.

3.3.1.1 Inserts. Insert material shall be per specification MIL-M-14 diallyl phthalate resin type SDG-F or GDF-30F, or MDG.

3.3.1.2 Loading Sleeve. Material shall be nylon 6/6, white or natural per specification L-P-410.

3.3.2 Rubber. Rubber material shall be per specification MIL-R-3065. Composition and hardness shall be such that the fabricated parts when assembled with other parts into a finished connector will meet the requirements of this specification.

3.3.3 Metals. Metals used to fabricate connectors covered by this specification may be aluminum, aluminum alloy, brass, steel or corrosion resistant steel. Where dissimilar metals are used in intimate contact with each other, protection against electrolysis and corrosion shall be provided. Dissimilar metals shall be as defined in MIL-STD-889. Dissimilar metals such as brass, copper or steel (except corrosion-resisting steel), passivated in accordance with QQ-P-35 shall not be used in intimate contact with aluminum or aluminum alloy.

3.3.3.1. Contacts. All contacts shall be HALF HARD BRASS, comp. 360 per QQ-B-626. Finish shall be Gold Plate per MIL-G-45204 Type I, Grade C, Class 0. (.000030) over Nickel per QQ-N-290 Class I grade C (.001) . Copper underplate optional before nickel. If used must be min. .0002.

Contacts are to be washed in hot water only to remove salts. Do not burnish, tumble, or coat in any manner so as not to interfere with cements used for bonding contact into plastic.

Spring elements of the spring loaded contacts shall be: Beryllium Copper Cond. HT per QQ-C-530. Finish: Silver Plate M351 per MIL-R-14072.

3.3.3.2 Connector Shell. The connector shell may be fabricated entirely of stainless steel or with a stainless steel liner covered with plastic. The stainless steel shall be type 303, cond. A, cold rolled annealed per ASTM A582. The plastic covering shall be black, glass filled nylon 6, 6/10 or 6/12 type per ASTM D4066.

3.3.3.2.1 Connector Locking Pins. The three connector locking pins as required in the female type connectors shall be heat-treated stainless steel type 304, cond. H, per ASTM A582 the pins each having a diam. of 0.044±.001 inch on the exposed surface. The base circle dia. of the 3 pins shall be .557±.002 inch.

3.3.3.3 Bend Relief Spring. The bend relief spring shall be fabricated using steel, corrosion-resisting wire, form I, condition B, composition 302, per ASTM A313. Finish with chemical blackening process, class 3 per MIL-C-13924.

3.3.3.4 Finish Protective. Finish on the exposed surfaces of aluminum or aluminum alloy parts shall be dyed black finish E-511 per MIL-F-14072. The stainless steel shall be light sand blast, finish type E300 per MIL-F-14072.

3.4 Design and Construction. Connectors shall be of the design, construction, and physical dimensions specified (See 3.1).

3.4.1 Threaded Parts. Unless otherwise specified (See 3.1), all threaded parts shall be in accordance with FED-STD-H28.

3.4.2 Casting and Molded Parts.

3.4.2.1 Casting. Casting shall be of uniform quality and conditions, and free from harmful cracks, shrinkage, porosity, gas holes, foreign matter and other injurious defects. The surface of the castings shall be free from pits, parting lines, porous areas, fins, ridges, modules, raised metal and scale. All castings shall be completely cleaned prior to presentation for inspection. Castings shall not be plugged or welded, nor shall imperfections be filled in.

3.4.2.3 Molded Parts. Molded parts shall be uniform in quality, condition and color. The molded parts shall be clean, smooth, free from porous areas, foreign materials, weak sections, bubbles, flash and any other injurious defects.

3.4.3 Cleaning.

3.4.3.1 Parts. After fabrication, parts shall be cleaned in accordance with good commercial practice, or as specified in an applicable document. Cleaning processes shall have no deleterious effect. Corrosive material shall be removed completely before the parts are assembled.

3.4.3.2 Connectors. After assembly, connectors shall be cleaned and shall be free from foreign material.

3.4.4 Alignment Dot. Alignment dot shall be a depression filled with orange epoxy paint.

3.5 Electrical.

3.5.1 Dielectric Withstanding Voltage. There shall be no arcing or dielectric breakdown when the connectors are tested in accordance with 4.7.1.

3.5.2 Insulation Resistance. When tested as specified in 4.7.2 the insulation shall be not less than 1,000 megohm except for unmated connectors following the immersion test when it shall not be less than 100 megaohms.

3.5.3 Contact Resistance. The electrical resistance of each non-rigid contact shall be such that the terminal-to-terminal resistance of mated connector contacts will not exceed 0.050ohm. (See 4.7.3)

3.6 Mechanical Requirements.

3.6.1 Contact Depression. The force required to depress the contacts of connectors with non-rigid contacts to the distance specified in 4.8.1 shall not exceed 1.75 lbs. or be less than 1.25 lbs. per individual contact. For 5 contacts, total contact depression force shall not exceed 8.75 lbs. or less than 6.25 lbs. For 6 contacts, total depression force, shall not exceed 10.5 lbs. or be less than 7.5 lbs. (See 4.8.1)

3.6.2 Air Pressure. Connectors shall show no evidence of leakage through the connector, when tested as specified in 4.8.2.

3.6.3 Mating Action. After the 3000 matings, as specified in 4.8.3, connectors shall show no mechanical damage, and the dielectric, contact resistance, and air pressure as specified in 3.5.1, 3.5.3 and 3.6.2, respectively, shall be met.

3.6.4 Contact Retention. The individual contacts shall be capable of withstanding an axial load of at least 10 pounds when tested in accordance with 4.8.4.

3.6.5 Interchangeability. When tested as specified in 4.8.5, like units, assemblies, and subassemblies shall be physically and functionally interchangeable, without modification of such items or of the connector. Individual items shall not be hand-picked for fit. Reliance shall not be placed on any unspecified dimension, characteristics, etc.

3.6.6 Compression. When connectors are tested as specified in 4.8.6, there shall be no evidence of distortion or damage to the connectors that would affect form, fit, or function.

3.6.7 Pull Test. When mated and tested in accordance with paragraph 4.8.7, connectors shall withstand an axial pull of not less than 40 lbs applied to the shell, and 25 lbs applied to the cable. In each instance the weight is to be applied abruptly.

3.7 Service Conditions.

3.7.1 Bounce. After being tested as specified in paragraph 4.9.1 the connectors shall show no evidence of cracking, breaking or loosening of parts. Following the test, the connectors shall then meet the electrical requirements of 3.5, air leakage requirement of 3.6.2, and interchangeability 3.6.5.

3.7.2 Vibration. When mated connectors are tested as specified in 4.9.2, there shall be no evidence of cracking, breaking, or loosening of parts and the plug shall not become disengaged from the receptacle. Following the test, the connectors shall meet the electrical requirements of 3.5 and the air leakage requirement of 3.6.2.

3.7.3 Drop. Connectors subjected to the test of 4.9.3 shall show no physical damage which would affect mateability nor shall there be any loose parts. Following the test, the connectors shall then meet the electrical requirements of 3.5 and the air leakage requirement of 3.6.2.

3.7.4 Temperature Cycling. During the fifth cycle of the test specified in 4.9.4 the connectors shall be capable of being mated and unmated. Following the test, the connectors shall meet the electrical requirements of 3.5 and air leakage requirements of 3.6.2.

3.7.5 Salt Spray. After unmated connectors are tested in accordance with 4.9.5 there shall be no evidence of base metal corrosion.

3.7.6 Humidity. Mated and unmated connectors shall be subjected to the test specified in 4.9.6. Following the test, the connectors shall meet the electrical requirements of 3.5 and the air leakage requirement of 3.6.2.

3.7.7 Water Immersion. There shall be no evidence of leakage into the body of unmated connectors or into the body or contact-face area of mated connectors, when tested as specified in 4.9.7.

3.8 Marking. Marking shall conform to Specification MIL-M-13231.

3.9 Identification of Contacts. All contacts shall be identified by letters either raised or depressed on the front and on the rear surface of each male and female insert. Lettering shall be as specified on the individual specification sheets.

3.10 Workmanship. Connectors and accessories shall be processed in such a manner as to be uniform in quality and shall be free from burrs, crazing, cracks, voids, pimples, chips, blisters, pinholes, sharp cutting edges, and other defects as listed in paragraph 4.10, that will adversely affect life, serviceability, or appearance. The connectors shall comply with the requirements of 3.3, 3.4, 3.8, and 3.9.

3.11 Systems Safety Engineering

3.11.1 Personnel Hazards. Personnel hazards shall be kept to a minimum. The criteria of MIL-T-28800 shall be made applicable for tasks and efforts such as the selection of parts, the complete manufacturing and assembly process, and any product baseline configuration changes that may be implemented during the course of the contract. Verification that compliance with this requirement has been achieved shall be through visual inspection. (See 4.11)

3.11.2 Edge Rounding Exposed. Exposed edges and corners shall be rounded sufficiently to minimize laceration/puncture hazards, the design goal being a minimum radius of 0.04 inch (1mm) for edges and a minimum of 0.5 inch (12.7 mm) for corners.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for Inspection. Unless otherwise specified in the contract or purchase order, the contractor is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified in the contract or purchase order, the contractor may use his own or any other facilities suitable for the performance of the inspection requirements specified herein, unless disapproved by the Government. The Government reserves the right to perform any of the inspections set forth in the specification where such inspections are deemed necessary to assure supplies and services conform to prescribed requirements.

4.1.1 Responsibility for Compliance. All items must meet all reqirements of sections 3 and 5. The inspection set forth in this specification shall become a part of the contractors overall inspection system or quality program. The absence of any inspection requirements in the specification shall not relieve the contractor of the responsibility of assuring that all products or supplies submitted to the Government for acceptance comply with all reqirements of the contract. Sampling in quality conformance does not authorize submission of known defective material, either indicated or actual, nor does it commit the Government to accept defective material.

4.1.2 Test Equipment and Inspection Facilities. Test and measuring equipment and inspection facilities of sufficient accuracy, quality, and quantity to permit performance of the required inspection shall be established and maintained by the contractor.

The establishment and maintenance of a calibration system to control the accuracy of the measuring and test equipment shall be in accordance with MIL-STD-45662, including automatic test equipment.

4.1.3 Automatic Testing. The inspection for insulation resistance and dielectric withstanding voltage may be performed by automatic means, except during qualification testing. Insulation resistance and dielectric withstanding voltage may be performed simultaneously in less than one minute provided that the current flow in the circuit is zero before automatically proceeding to the next step. In addition, the automatic test equipment shall be manually reset when failure occurs.

4.1.4 Test Conditions.

4.1.4.1 Test Fixture. Connector test sample can be mated with a test fixture unit to perform electrical testing provided all applicable test conditions are maintained.

4.1.4.2 Preconditioning. The contractor shall be permitted to precondition the connector samples prior to performing any electrical tests. The preconditioning shall consist of removing surface moisture from the connectors by wiping, drying, blowing, or heating. The application of heat shall be limited to 3 minutes. For unmated connectors to be subjected to immersion and humidity test, a 24 hour waiting period in an ambient room temperature with a relative humidity of 50 ± 5% is permitted.

4.1.4.3 Preparation of Samples for Immersion and Air Pressure.

4.1.4.3.1 Connector, plug. The cable entry shall be sealed with a solid rubber plug having a length of approximately 6 inches and a diameter within +.005 of the minimum cable size given in Table I.

4.1.4.3.2 Connector Receptacle. Connector receptacles shall be mounted using the normal mounting method so that only the front face is exposed to water.

4.2 Classification of Inspections. The inspections specified herein are classified as follows:

a. Materials inspection (See 4.3).
b. Qualification inspection (See 4.5).
c. Quality conformance inspection (See 4.6).
d. Packaging inspection (see 4.12).

4.3 Materials Inspection. Materials inspection shall consist of certification supported by verifying data that the materials used in fabricating the connectors and accessories are in accordance with the applicable specifications or requirements prior to such fabrication.

4.4 Inspection Conditions. Unless otherwise specified herein, all inspections shall be performed in accordance with the test conditions specified in "GENERAL REQUIREMENTS" MIL-STD-1344.

4.5 Qualification Inspection. Qualification inspection shall be performed at a laboratory acceptable to the Government (See 6.5) on sample units (See 3.1) produced with equipment and procedures normally used in production.

4.5.1 Samples. Nine (9) mated pairs of connectors from each specification sheet to be qualified shall be subjected to qualification inspection. Mated receptacles and plugs shall be in accordance with Table II.

TABLE II. MATING CHARACTERISTICS

Plug	mates with	Receptacle
MIL-C-55116 /1&3		MIL-C-55116/9 MIL-C-55116/11 MIL-C-55116/13
MIL-C-55116/2&4		MIL-C-55116/10 MIL-C-55116/12 MIL-C-55116/14
MIL-C-55116/5&7		MIL-C-55116/9 MIL-C-55116/11 MIL-C-55116/13
MIL-C-55116/6&8		MIL-C-55116/10 MIL-C-55116/12 MIL-C-55116/14

TABLE III. QUALIFICATION INSPECTION

Inspection	Requirement Paragraph	Test Paragraph	1	2	3	4	5	6	7	8	9
			P R	P R	P R	P R	P R	P R	P R	P R	P R
Visual and Mechanical----	3.3,3.4,3.8 3.9,3.10	4.10	U U	U U	U U	U U	U U	U U	U U	U U	U U
Dielectric withstanding voltage----------	3.5.1	4.7.1	U U	U U	U U	U U	U U	U U	U U	U U	U U
Insulation resistance----	3.5.2	4.7.2	U U	U U	U U	U U	U U	U U	U U	U U	U U
Air pressure----------	3.6.2	4.8.2	U U	U U	U U	U U	U U	U U	U U	U U	U U
Interchangeability-------	3.6.5	4.8.5	U U	U U	U U	U U	U U	U U	U U	U U	U U
Contact resistance-------	3.5.3	4.7.3	M M	M M	M M	M M	M M	M M	M M	M M	M M
Dielectric withstanding voltage (High altitude)----------	3.5.1	4.7.1.2	U U	U U	U U	U U	U U	U U	U U	U U	U U
Humidity----------	3.7.6	4.9.6	U U	M M	- -	- -	- -	- -	- -	- -	- -
Contact depression-------	3.6.1	4.8.1	- U	- U	- U	- U	- U	- U	- U	- U	- U
Contact retention--------	3.6.4	4.8.4	U U	U U	U U	- -	- -	- -	- -	- -	- -
Temperature cycling------	3.7.4	4.9.4	M*M*	U U	U U	- -	- -	- -	- -	- -	- -
Mating action----------	3.6.3	4.8.3	U U	U U	U U	- -	- -	- -	- -	- -	- -
Pull test----------	3.6.7	4.8.7	- -	- -	- -	M -	M -	M -	- -	- -	- -
Vibration----------	3.7.2	4.9.2	- -	- -	- -	M M	M M	M M	- -	- -	- -
Salt spray----------	3.7.5	4.9.5	- -	- -	- -	U U	U U	U U	- -	- -	- -
Immersion----------	3.7.7	4.9.7	- -	- -	- -	- -	- -	- -	M*M*	U U	U U
Bounce----------	3.7.1	4.9.1	- -	- -	- -	- -	- -	- -	M M	M M	M M
Drop----------	3.7.3	4.9.3	- -	- -	- -	- -	- -	- -	M M	M M	M M
Compression----------	3.6.6	4.8.7	- -	- -	- -	- -	- -	- -	U U	U U	U U

P= Plug U-229B, U-182( )/U
R= Receptacle U-183/U-228
M= Mated plug and receptacle: Mated Tests - U-229B & U-182 shall be mated to U-183, U-228 shall be mated to U-229B.
U= Unmated
M*= For purposes of qualification inspection the three samples shall be arranged as follows: One mated and two unmated

4.5.2 Inspection Routine. Sample connectors shall be subjected to the inspection in Table III.

4.5.3 Failures. One or more failures shall be cause for refusal to grant QPL approval.

4.5.4. Retention of Qualification. To retain qualification the contractor shall furnish the following reports to the qualifying activity at the time intervals specified:

a. 12 month intervals - A summary of the results of both group A and group B tests performed for inspection of product for delivery, indicating as a minimum the number of lots that have passed and the number that have failed. The results of tests of all reworked lots shall be identified and accounted for.

b. 24 to 36 months intervals - A summary of the results of group C tests performed for qualification inspection, including the number and mode of failures. The contractor shall forward the initial report at the end of 24 months; subsequent reporting periods will be 36 months. The qualifying activity shall establish the initial reporting date. If the summary of the test results indicated nonconformance with the specification requirements, and corrective action acceptable to the qualifying activity has not been taken, action may be taken to remove the failing product from the qualified products list.

Failure to submit the report within 30 days after the end of each 12-, 24- or 36-month period may result in loss of qualification for the product. In addition to the periodic submission of inspection data, the contractor shall immediately notify the qualifying activity at any time during the 12-, 24- or 36-month period that the inspection data indicates failure of the qualified product to meet the requirements of this specification.

In the event that no production occurred during the reporting period, a report shall be submitted certifying that the company still has the capabilities and facilities necessary to produce the item. If during two consecutive reporting periods there has been no production, the manufacturer may be required, at the discretion of the qualifying activity, to submit a representative product of each part number for testing in accordance with the qualification inspection requirements.

4.6 Quality Conformance Inspection.

4.6.1 Responsibility for Inspection. Unless otherwise specified in the contract or purchase order, the supplier is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified in the contract order, the supplier may use his own or any other facilities suitable for the performance of the inspection requirements specified herein, unless disapproved by the government. The government reserves the right to perform any of the inspections set forth in the specifications where such inspections are deemed necessary to assure supplies and services conform to prescribed requirements.

4.6.2 Inspection of Product for Delivery. Inspection of product for delivery shall consist of groups A, B and C.

4.6.2.1 Inspection Lot. An inspection lot shall consist of all the connectors of the same part number, produced under essentially the same conditions, and offered for inspection at one time.

4.6.2.2 Unit of Product. The unit of product, for purposes of sampling, shall be each connector as specified in the contract or order.

4.6.2.3 Sample. The sample consists of one or more units of product drawn from a lot, the units of the sample being selected at random without regard to their quality. The number of units of product in the sample is the sample size.

4.6.2.4 Specimen. A specimen may be one unit of product or any portion of the unit of product which is to be subjected to inspection.

4.6.2.5 Rejected Lots. If an inspection lot is rejected after Group A or Group B inspection, the contractor may withdraw the lot, rework to correct the defects, or screen out the defective units, as applicable, and reinspect. Such lots shall be separate from new lots, and shall be clearly identified as reinspected lots. Resubmitted lots shall be inspected using tightened inspection.

4.6.3 Group A Inspection. Group A inspection shall consist of the inspection specified in Table IV in the order shown.

4.6.3.1 Sampling Plan. Statistical sampling and inspection shall be in accordance with MIL-STD-105 for general inspection level II. The acceptable quality level (AQL) shall be as specified in Table IV. Major and minor defects shall be as defined in MIL-STD-105.

TABLE IV. GROUP A INSPECTION

Inspection	Requirement paragraph	Test method paragraph	AQL Major	AQL Minor
Visual and mechanical	3.3, 3.4, 3.8, 3.9, 3.10	4.10	1%	4%
Electrical			1% for the group combined	#
Dielectric withstanding voltage	3.5.1	4.7.1		
Insulation resistance	3.5.2	4.7.2		
Air pressure	3.6.2	4.8.2	1%	#

#All electrical, and air pressure defects are considered major.

4.6.4 Group B Inspection. Group B inspection shall consist of the inspections specified in Table V in the order shown, and the sample shall be selected from inspection lots that have passed group A inspection.

4.6.4.1 Sampling Plan. The sampling plan shall be in accordance with MIL-STD-105 for special inspection level S-3. The sample size shall be based on the inspection lot size from which the sample was selected for Group A inspection. The AQL shall be as specified in Table V.

TABLE V. GROUP B INSPECTION

Inspection	Requirement paragraph	Test method paragraph	AQL %
Contact resistance	3.5.3	4.7.3	4.0
Contact retention	3.6.4	4.8.4	4.0
Interchangeability	3.6.5	4.8.5	1.0
Contact Depression	3.6.1	4.8.1	4.0

4.6.4.2 Disposition of Sample Units. Sample units which have passed Group A & B inspection are deliverable on the contract or order.

4.6.5 Group C Inspection. Group C inspection shall consist of the inspections specified in Table VI in the order shown. Group C inspection shall be made on sample units selected from inspection lots which have passed the group A and B inspection/

4.6.5.1 Sampling Plan. Sample units shall be subjected to the tests specified in Table VI every 12 months.

TABLE VI. GROUP C INSPECTION

Inspection	Requirement paragraph	Test method paragraph	No. of sample units
Pull Test	3.6.7	4.8.7	2
Humidity	3.7.6	4.9.6	2
Mating Action	3.6.3	4.8.3	2
Temperature cycling	3.7.4	4.9.4	2
Vibration	3.7.2	4.9.2	2
Salt spray	3.7.5	4.9.5	2
Bounce	3.7.1	4.9.1	2
Drop	3.7.3	4.9.3	2
Water immersion	3.7.7	4.9.7	2
Compression	3.6.6	4.8.6	2

4.6.5.2 Failures. If one or more sample units fail to pass Group C inspection, the sample shall be considered to have failed.

4.6.5.3 Disposition of Sample Units. Sample units which have been subjected to group C inspection shall not be deliverable on the contract.

4.7 Electrical Tests.

4.7.1 Dielectric Withstanding Voltage.

4.7.1.1 At Sea Level. A potential of 500 volts rms shall be applied between each contact of the connector and the remaining contacts connected together and to the shell. The voltage shall be increased gradually from zero until the specified voltage is reached and shall be maintained at the value for approximately, but not less than 1 minute. The specified voltage shall be reached within 5 seconds. (See 3.5.1)

4.7.1.2 At High Altitude. At a barometric pressure of 3.4 inches of mercury, a voltage of 300 V rms shall be applied as described in 4.7.1.1 and the connector shall meet the requirement specified in 3.5.1.

4.7.2 Insulation Resistance. The insulation resistance shall be measured between each contact of the connector and the remaining contact connected together and to the shell. (See 3.5.2)

4.7.3 Contact Resistance. The connector shall be mated with a test jig having non-rigid contact and the electrical resistance between mating contact terminals shall be measured with a Kelvin bridge, or other approved method. (See 3.5.3)

4.8 Mechanical Tests.

4.8.1 Contact Depression. Two tests are required. First, a test plate shall be applied to non-rigid contacts of the U-228 and U-183 in such a manner that the face of the contacts shall be depressed .080 inches from the normal plane of the face of the contact, and the force required to accomplish this shall be recorded. Second, a test jig shall be used that will permit the depression of each individual contact - each contact in turn shall be depressed .080 inches from the normal plane of the contact face and the depression force required shall be recorded. The forces required shall be in accordance with 3.6.1 and at the conclusion of contact depression measurements, the contact resistance of each contact shall meet the requirements of 3.5.3.

4.8.2 Air Pressure. To detect leakage, a pressure of 2.5 pounds per square inch shall be applied to the contact face and then to the rear of the plug or receptacle, using the differential leakage tester described in Figure 1, or an equivalent method approved by the Government inspector. (See 3.6.2)

4.8.3 Mating Action. The connector shall be mated and unmated 3000 times with the applicable mating connector at the rate of not more than 30 mating cycles per minute. (See 4.9.8.1) The connector shall be examined for mechanical damage and then tested for contact resistance, air pressure, and dielectric in accordance with 4.7.3, 4.8.2 & 4.7.1 respectively, as applicable. Failure of any of these tests shall constitute failure of the mating action test.

Failure of the sample connector due to failure of the applicable mating connector shall invalidate the test. The mating connector shall not be used for more than one mating action test. (See 3.6.3)

4.8.4 Contact Retention. An axial load shall be applied to the individual contacts of the sample connector with all contacts in place and the insert mounted in the shell. The load shall be applied uniformly at a rate of approximately one (1) pound per second. The load shall be applied first in one direction and then in the opposite direction. Contacts shall meet the requirements of 3.6.4.

4.8.5 Inspection for Interchangeability. The dimensions shall be gaged, using applicable gages as specified in the applicable specification sheet to determine conformance to the physical interchangeability requirements of 3.6.5.

4.8.6 Compression. The connectors shall be subject to a compression force of 500 pounds applied to it's axis, sustaining no damage that will affect performance. (See 3.6.6 and FIG. 3)

4.8.7 Pull Test. The recepticle and plug shall be mated. The recepticle shall be mounted rigidly in a verticle plane. A device such as a sling or harness shall be affixed to the plug which is below the recepticle. A dead weight of 40 lbs is placed on the device. Repeat this test by adding 25 lbs to a device secured to the cable. In each instance, the weight is abruptly placed on the device. At the completion of the test, the recepticle and plug shall unlock and lock without dificulty, and there shall be no visible damage. (See 3.6.7)

4.9 Service Conditions.

4.9.1 Bounce Test. The connector shall be placed on a table of the Package Tester, Type 1000SC, as made by the L.A.B. Corporation, Skaneateles, N.Y. or equal, and shall be constrained from a horizontal motion of more than 2 inches by suitable wooden fences. The package tester, shafts in phase, shall be operated at a speed of 284 ± 2 rpm for a total of 3 hours. Contact resistance, insulation resistance, dielectric, and air pressure tests shall follow (4.7.3, 4.7.2, 4.7.1, 4.8.2). There shall be no degradation in performance. (See 3.7.1)

4.9.2 Vibration.

4.9.2.1 Vibration for U-183( )/U. Connector Receptacle U-183 shall be mounted securely to a plate mounted on the vibration table. Corresponding mating plug U-229 shall be mated to it. Unit shall be tested in accordance with MIL-STD-202, method 201A. (See 3.7.2)

4.9.2.2 For U-228( )/U and U-229( )/U. The Plugs U-228( )/U or U-229( )/U shall be securely mounted by metal straps to a plate mounted on the vibration table in such a manner that the mating Plug U-229( )/U or Receptacle U-183( )/U when mounted with it, is not supported by any means other than the coupling device.

The corresponding plug shall be mated with it and the coupling nut tightened, finger tight. (See 3.7.2) Unit shall be tested in accordance with MIL-STD-202, method 201A.

4.9.3 Drop. The connector shall be dropped six times at random from a height of six feet. The floor or barrier receiving the impact shall be 2 inch fir backed by a concrete or a rigid steel frame. Contact resistance, dielectric, and air pressure tests shall follow (4.7.3, 4.7.1, & 4.8.2). There shall be no degradation in performance. (See 3.7.3)

4.9.4 Temperature Cycling. The connectors with mating connectors shall be subjected to temperature cycling in accordance with Method 107 test condition A of MIL-STD-202. Half of the connectors shall be mated and half shall be unmated when placed into each temperature condition.

It shall be possible to mate and unmate the connectors, at temperature extremes and there shall be no loss of continuity. (See 3.7.4)

4.9.5 Salt Spray. The connectors shall be subjected to salt spray (corrosion) in accordance with Method 101D Test Condition B of Standard MIL-STD-202. (See 3.7.5)

4.9.6 Humidity. After being prepared for test as indicated in 4.1.4.3, 50 percent of the connectors shall be mated and 50 percent shall be unmated. The connectors shall be tested in accordance with method 1002, type II of MIL-STD-1344, except steps 7a and 7b shall not be required. The connectors shall meet the requirements of 3.7.6.

NOTE: The connectors may be placed in the humidity chamber in such a manner as to preclude accumulation of moisture on the contact face.

4.9.7 Water immersion. Connector Plugs U-228( )/U and U-229( )/U assembled to separate test cables and each other, or U-229( )/U with Connectors Receptacle U-183, shall be immersed in tap water to a depth of 6 feet for a period of 48 hours in accordance with (1), (2), and (3) below. The length of the cable shall be such that the cable extends a few feet outside of the tank. (See 3.7.7)

(1) The receptacles tested shall be completely sealed against leakage or shall be mounted by their normal means to the wall of the water tank so that the terminal end of the shell is external to the tank and the water in the tank does not leak through the junction of the receptacle and the tank.

(2) Mated connectors - 50% of the connectors tested shall be mated. Insulation resistance of the still mated units shall be measured at the end of the test and shall meet the requirement of 3.5.1.

(3) Unmated connector - 50% of the connectors tested shall remain unmated. Upon completion of the test, all excess moisture shall then be removed and the connector dried by room temperature compressed air for a period of 5 minutes. Insulation resistance shall be measured within 1/2 hour after test is performed and shall meet the requirement of 3.7.2. They shall then be examined for leakage into the body.

4.9.8 Mating Test-connector. Test connectors necessary for the performance of tests requiring a mating connector shall be the applicable mate as specified in 1.2. They shall have passed the visual and mechanical inspection of 4.10.

4.9.8.1 Test Cables. For test purpose plug connectors U-228( ), U-182 & U-229 will be equipped with length of cable no less than 7 feet.

4.10 Visual and Mechanical Inspection. Connectors shall be examined for the defects listed in Table VII.

4.11 Visual and Mechanical Inspection for Safety Requirements.

An inspection shall be performed to verify compliance with those portions of 3.11 (Systems Safety Engineering) which can be determined visually. (See 3.11)

TABLE VII. CLASSIFICATION OF VISUAL AND MECHANICAL DEFECTS

Defect areas	Major	Minor
Dimensions	Not as specified.	All defects are considered major.
Materials and finish	Not as specified. Wrong or incomplete finish. Large amounts of flaking, peeling, or chipping of finish	Scratches, cuts, abrasions, etc. causing exposure of base metal, or relatively small amount of flaking, peeling or chipping.
Parts	Missing parts. Inoperative, improperly assembled, or defective parts which could cause the component to fail in service. Wrong parts.	Defective parts which would reduce efficiency of use, but not cause failure in service.
Marking	Marking missing, illegible or incorrect.	Marking dirty, smudged, or incorrectly placed, but legible.
Contact identification	Contact identification, missing, illegal, or incorrect.	All defects are considered major.
Foreign objects	Any metallic foreign object, not firmly attached, which could cause a short circuit, an electrical-contact failure. Any nonmetallic foreign object such as insulation, dirt, or phelolic chips that could cause jamming of mechanism or prevent electrical contact.	Any foreign object which would not have any effect on the proper operation or use of the connector.

4.12 Packaging Inspection. Packaging inspection requirements specified herein are classified as follows:

a. First Article Inspection of Packaging.
b. Quality Conformance Inspection of Packaging.

4.12.1 First Article Inspection of Packaging. Unless otherwise specified in the contract, First Article Inspection of Packaging shall be in accordance with the Unit Pack Design Validation Requirements of MIL-P-116.

4.12.2 Quality Conformance Inspection of Packaging.

4.12.2.1 Materials Inspection. All materials to be used in packaging shall be inspected in accordance with the applicable material specification.

4.12.2.2 Preservation Inspection. Inspection of preservation and interior markings shall be in accordance with group A and B Quality Conformance Inspection Requirements of MIL-P-116. Lot formation and sampling procedures shall be as specified therein.

4.12.2.3 Packaging Inspection. Inspection of packing and the marking for shipment and storage shall consist of the examinations specified in Table IX entitled "Packing Inspection Provisions." Lot formation shall consist of all packs made of the same materials during an identifiable period and submitted at one time for acceptance. Sampling procedures shall be in accordance with MIL-STD-105, using a single sampling plan and Acceptable Quality level of 4.0 percent defective.

5. PACKAGING

5.1 Packaging Requirements. The requirements for packaging shall be in accordance with MIL-C-55330.

6. NOTES

6.1 Intended Use. The connectors are used in connection with audio frequency equipments, such as headsets, chestsets, handsets, etc.

TABLE IX

PACKING INSPECTION PROVISIONS.

NO.	CHARACTERISTIC	METHOD OF INSPECTION
101	Intermediate container not as specified	Visual
102	Improper closure of intermediate container	Visual
103	Shipping containers not in accordance with specification	Visual
104	Excessive cube	Visual
105	Improper blocking and bracing	Visual
106	Closure not in accordance with specification	Visual
107	Weight and size exceed container limitations	Weight & Measure
108	Strapping not in accordance with specification, incorrectly applied, omitted	Visual
109	Marking omitted, incorrect, or illegible	Visual

6.2 Ordering Data. Procurement documents should specify the following:

a. Title, number and date of this specification and any amendment thereto.
b. Type required.
c. Level A or B preservation and packing (see section 5).
d. When first article inspection rough handling tests are not required.
e. Preproduction inspection.
   1. See paragraph 3.2 for number of samples.
f. Marking and shipping of samples.
g. Place of final inspection.
h. When first article packaging inspection reports require Acquisition Activity approval prior to production unit packing

6.3 Group C Inspection. Approval to ship may be withheld, at the discretion of the Government pending the decision from the contracting officer on the adequacy of corrective action. (See 4.5.3.2.)

6.4 Verification Inspection. Verification by the Government will be limited to the amount deemed necessary to determine compliance with the contract and will be limited in severity to the definitive quality assurance provisions established in this specification and the contract. The amount of verification inspection by the government will be adjusted to make maximum utilization of the contractor's quality control system and the quality history of the product.

6.5 Qualification. With respect to products requiring qualification, awards will be made only for products which are at the time set for opening of bids, qualified for inclusion in the applicable qualified products list, whether or not such products have been listed by that date. The attention of the contractors is called to this requirement and manufacturers are urged to arrange to have the products that they propose to offer to the Federal government tested for qualification, in order that they may be eligible to be awarded contracts or orders for the products covered by this specification. The activity responsible for the Qualified Products List is the Defense Electronic Supply Center, ATTN: DEXC-EQP.

6.6 Provisions Governing Qualification. Copies of "SD-6, Provisions Covering Qualification", are issued for the information of applicants requesting qualification of products. Copies of this publication may be obtained from the Commanding Officer, Naval Publications and Forms Center, 5801 Tabor Avenue, Philadelphia, Pennsylvania 19120.

6.7 Changes from Previous Issue. Asterisks (or vertical lines) are not used in this revision to identify changes with respect to the previous issue due to the extensiveness of the changes.

6.8 Level B preservation. When level B preservation is specified, this level of protection will only be used under known favorable conditions during transportation, storage, and handling.

6.9 Environmental. Environmental pollution preservation measures are contained in the packaging material specifications referenced herein. Refer to material specifications or preparing activity for recommended disposability methods.

6.10 Subject Terms (Key Word) List.

Connector
Connector, Miniature Audio
Connector, Plug, Electrical
Connector, Recepticle, Electrical

CUSTODIAN:

ARMY-CR

Preparing Activity:

ARMY-CR

Project No. 5935-A302

NOTE:

1. Two pierces to be coined so that cross section is tapered as shown.

2. O.D. of termination assembled to T-2049 tinsel cord to be force fit into .088/.086 ID.

3. Gap width to be adequate to allow insertion of termination assembled to cord into .088/.086 ID.

4. Scrap from cut off chaining link must extend no more than .020 from inclined front face.

5. External dimples or embosses or forming burr for retention of termination in contact may be located on this portion of periphery.

6. Termination to be formed into approx. "U" as shown above. Wire to be pushed down onto pierces and sides closed to form a cylinder.

7. Material to be quarterhard brass 0.011 inch thick; final plated with copper flash.

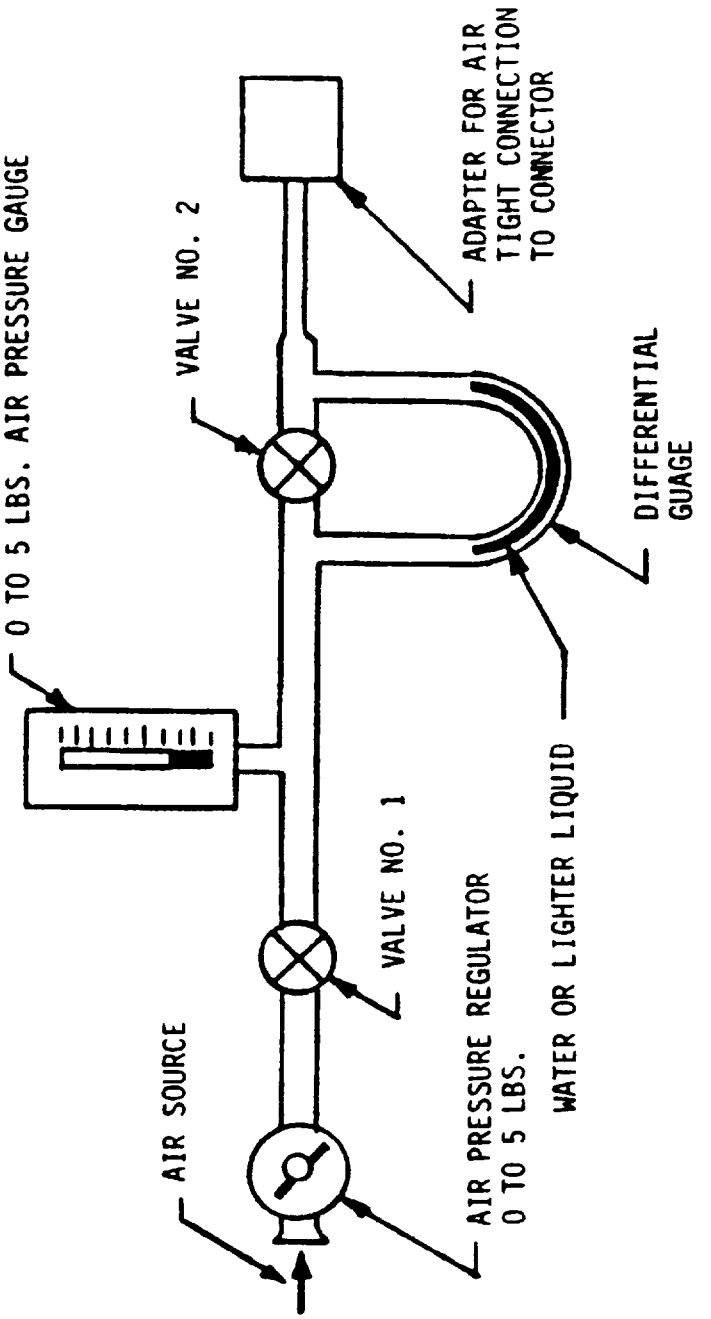

FIGURE 1. Diagram of air pressure test set up.

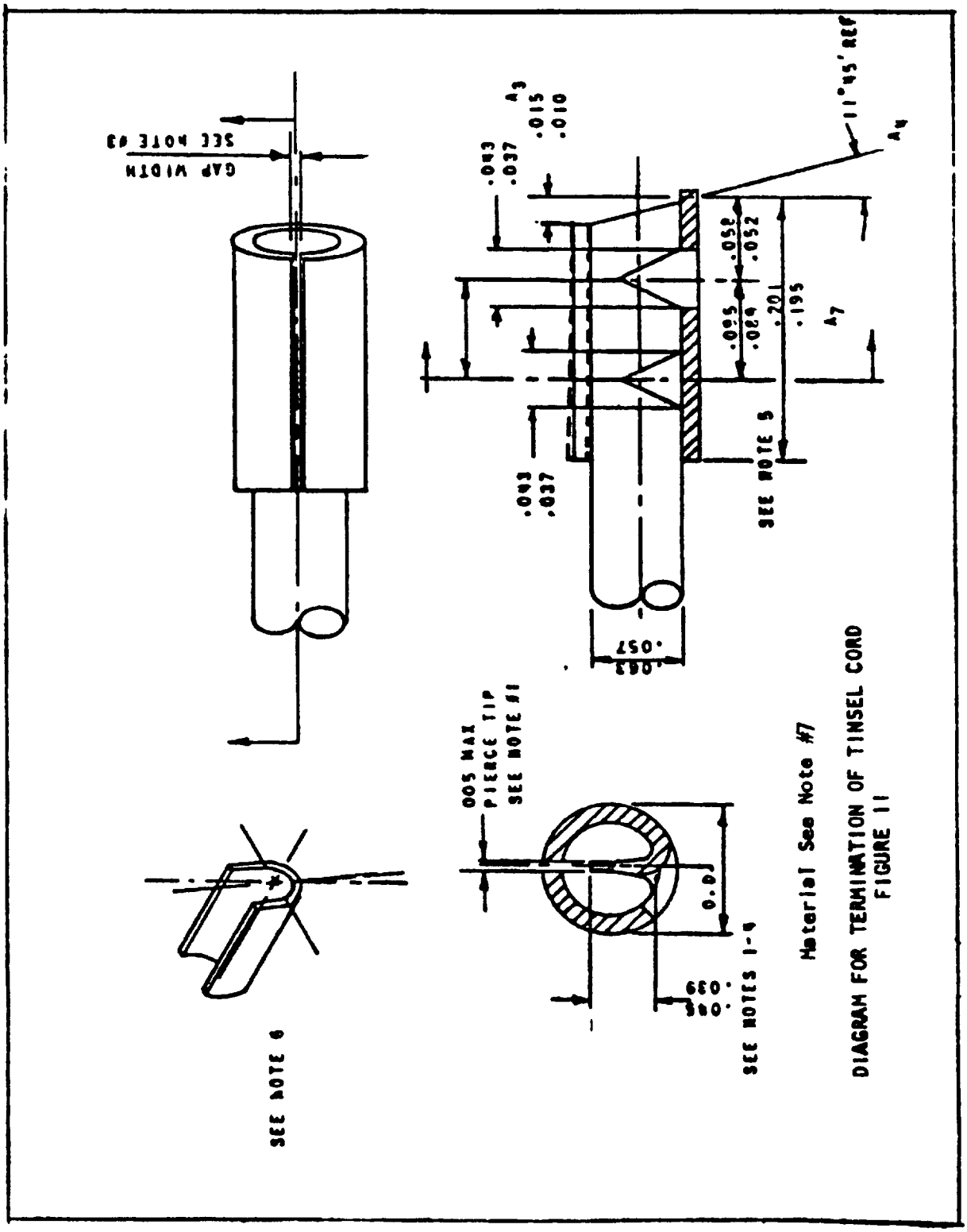

DIAGRAM FOR TERMINATION OF TINSEL CORD
FIGURE 11

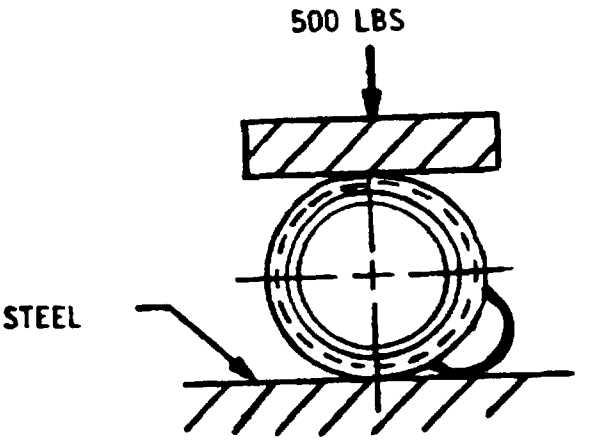

FIGURE 3. Compression test of shell.

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5 PROBLEM AREAS

a. Paragraph Number and Wording

b Recommended Wording

c Reason/Rationale for Recommendation

6 REMARKS

7a NAME OF SUBMITTER *(Last First, MI)* – Optional	b WORK TELEPHONE NUMBER *(Include Area Code)* – Optional
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